Trend Study 25B-2-99

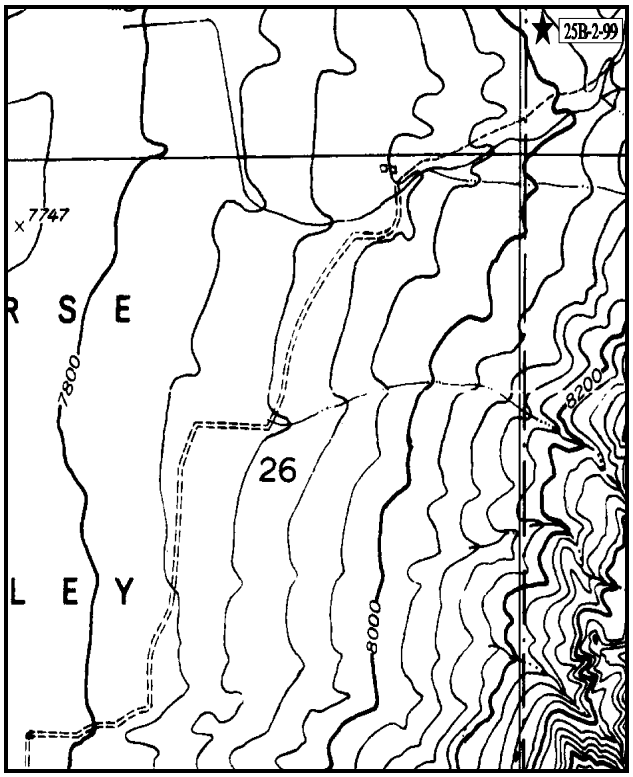
Study site name: Horse Valley . Range type: Big Sagebrush .

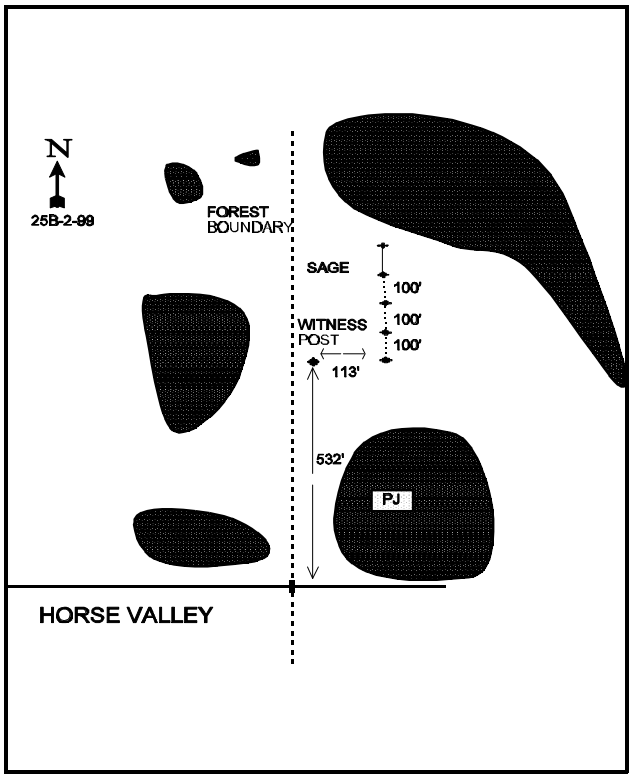
Compass bearing: frequency baseline 165°M.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11&95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

At the north end of main street (SR 24) in Lyman, SR 24 turns west towards Loa. Turn east here and go 0.35 miles to a 3-way split just beyond a cattleguard. Take the middle fork (the main road) and go 2.2 miles to a fork. Stay left and continue 1.05 miles on the main road to another fork. Again stay left and proceed 0.5 miles north just past a small reservoir to an intersection. Take the right fork toward Neffs Reservoir. On the main road, go 1.6 miles up and east across the top of some private land to a cattleguard at the Forest Service boundary. Park here, then walk 532 feet north along the east side of the fence to a witness post (rebar) next to the fence. The 400' stake is 114 feet east of the witness post. The 0-foot baseline stake lies 400 feet north, and has a red browse tag #7065 attached.





Map Name: Loa 1 NE, Utah

Diagrammatic Sketch

Township 27S , Range 3E , Section 24

UTM 4255485.545 N, 452812.384 E

DISCUSSION

Trend Study No. 25B-2 (46-2)

The Horse Valley transect is located in a sagebrush opening just east of the Forest Service boundary fence in Horse Valley. The other side of the fence is a strip of BLM land which has been proposed for a pinyon-juniper chaining and seeding treatment. Most of the valley is privately owned farmland. The study site has a gentle slope (3-5%) with a south-west aspect. The key species is Wyoming big sagebrush. Cattle graze in the area as part of the Thousand Lakes allotment. The area is thought to be a winter deer concentration area, with many moving into the lower fields in late winter or early spring. However, the pellet group transect read along the baseline in 1999 showed less than 1 days use/acre for both cattle and deer.

The light brown-orange soil appears to be moderate deep with an effective rooting depth of almost 15 inches. It is composed mainly of sand and some silt with little organic matter. Textural analysis indicates it is a sandy clay loam soil that is mildly alkaline (pH of 7.6). Amount of soil phosphorus (7.7 ppm) could be limiting to plant growth and development because it is below what is thought the minimal value of 10 ppm. Rocks and pavement together make up about 30% of the ground cover. Percent bare soil has varied from year to year, however the ratio of bare soil to protective cover has improved since 1994. This would indicate an improved trend for soil, but still poor condition with herbaceous cover only contributing to 20% of the total vegetative cover. Active gullies up to 1-1/2 feet deep are common. Movement of soil and rock fragments is detectable and in some places plant roots are exposed.

Wyoming big sagebrush provides almost all of the browse cover on this site. However, there has been a lot difficulty through the years differentiating between black sagebrush and Wyoming big sagebrush on this site. There is obviously a high occurrence of hybridizing between the two and the great deal of variation expressed in the plants within the area sampled. Wyoming big sagebrush visually dominates the area as it currently (‘99) makes up 91% of the browse cover. The population has many individuals that have hybridized with black sagebrush or with mountain big sagebrush. Forty percent of the leaf samples taken fluoresce with a black light, indicating regression with the higher elevation mountain big sagebrush. These sagebrush average 1 ½ feet in height and 2 feet and more in diameter. The Wyoming big sagebrush was generally vigorous and growing well in 1985, but since then percent decadency has increased and remained between 45 and 41% with the long term effects of the extended drought becoming evident. A majority (65%) of the plants have been only lightly hedged, while a few individuals have been more heavily utilized, usually individuals that are hybrids of mountain big sagebrush and Wyoming big sagebrush. The young age class and seedlings initially (1985) made up 22% of the population, but were scattered and occur only in patches. The combined biotic potential and young age class has steadily gone down since then to only 3% in 1994 and 10% in 1999.

While sagebrush dominates the browse cover, the more numerous broom snakeweed and narrowleaf low rabbitbrush make up less than 10% of the total browse cover. Since 1991, there have been large fluctuations in density estimates for broom snakeweed and low rabbitbrush. The narrowleaf low rabbitbrush is moderately abundant, but is generally small in stature. It displayed moderate to heavy use in past years (57% in ‘91 and 37% in ‘94), with some of the plants displaying poor vigor. Currently these shrubs appear unutilized. Broom snakeweed occurs over the entire area and appears unutilized. It had a vigorous expanding population in 1985 with a biotic potential (proportion of seedlings to the population) of 153%, which decreased rapidly by a factor of more than four times in 1994. Now it has grown rapidly back up again to 4,890 plants/acre. These kind of fluctuations in density occur often for this species with the variable precipitation patterns of southern Utah. Pinyon and pricklypear cactus appear to be slowly invading the area.

Forbs and grasses are scarce and diversity is low because Wyoming big sagebrushes cover is currently nearly 20%. The most abundant forb is pingue hymenoxys, an increaser which is often poisonous to sheep and sometimes cattle. Grass frequency is very low and the most common species are blue grama and bottlebrush squirreltail. The total cover from grasses and forbs currently is just over 4%.

1985 APPARENT TREND ASSESSMENT

Soil trend appears to be downward. The soil is fairly unstable and has a low amount of cover. Small gullies are common and active. Vegetative trend appears slightly down because of the increase of undesirable increasers. The Wyoming big sagebrush population appears stable and moderately used. A proposed chaining would be helpful on the adjacent mature pinyon-juniper woodlands and older sagebrush stands as long as adequate cover is left for wildlife. More herbaceous vegetation is needed in the area to provide green forage for transitional spring range.

1991 TREND ASSESSMENT

Soil trend appears to be continuing downward because percent bare ground and rock is increasing with a corresponding loss of litter cover. Key browse species have decreased densities. Black sagebrush has decreased by 43% with percent decadency going from 14% up to 75%. Wyoming big sagebrush densities did not go down very much (only 5%), but here again the percent decadency went from 14% up to 45%. Narrowleaf low rabbitbrush also lost some of it's population to the drought. It's population went down 13% with 96% of it's population classified as decadent. The most troubling aspect is that broom snakeweed increased by 24%. It went from 6,199 up to 8,199 plants per acre. This trend for broom snakeweed is contrary to most other sites in Utah this year.

TREND ASSESSMENT
soil - down, poor condition
browse - slightly down
herbaceous understory - stable, but still very poor condition

1994 TREND ASSESSMENT

Soil trend now appears to be stabilizing with percent bare ground cover slightly lower than 1991 estimates. The soils would have to still be considered in poor condition, but stable at this time. The key browse species (Wyoming big sagebrush) has a lower density, primarily because of the increased sample size giving better density estimates for populations with discontinuous distributions. The principal feature changes noted for monitoring the condition and trend of this sagebrush population is that there are no seedlings, the percent young is about 3%, and the percent of the population that are classified as decadent has slightly improved to 41%. However, 24% are now displaying poor vigor, up from 13% in 1991. Of major concern is that one in three Wyoming big sagebrush plants are dead. The proportion of black sagebrush displaying poor vigor has decreased to 33%, which is an improvement from 1991 when it was 75%. The increasers, narrowleaf low rabbitbrush and broom snakeweed, have experienced large decreases in their respective populations, 61% and 83%. The herbaceous understory trend is downward for nested frequency values for both grasses and forbs has gone downward since 1991.

TREND ASSESSMENT
soil - stable, but poor condition
browse - downward
herbaceous understory - downward

1999 ASSESSMENT OF TREND

Soil trend appears to be improving slightly with improving ratios of bare soil to protective cover. However, soils would still be considered in poor condition, but slightly improved at this time. Protective cover is still very low (herbaceous, litter, and cryptogamic cover), as illustrated by the number of active small gullies and pedestalling of most all the sagebrush. The key browse species (Wyoming big sagebrush) has a higher density, primarily because some of the plants were classified as black sagebrush during past readings. The

principal feature changes noted for monitoring the condition and trend of this population is that there are few seedlings (1%), the percent young is about 10%, and the percent of the population that are classified as decadent has remained in the low forties (41%, still considered high). Although, those classified with poor vigor have decreased to 13%. The proportion of the sagebrush population classified as black sagebrush has gone down to where it is a very small portion of the sagebrush population. The increasers, low rabbitbrush and broom snakeweed, have again experienced a large decrease and increase in their respective populations, -65% and +71%. The herbaceous understory trend is essentially stable for nested frequency values for grasses and forbs. However, herbaceous vegetation is till lacking.

TREND ASSESSMENT
soil - slightly improved, but still poor condition
browse - stable
herbaceous understory - stable, but still very poor

HERBACEOUS TRENDS --
Herd unit 25B, Study no: 2

Type	Species	Nested Frequency '85	'91	'94	'99	Quadrat Frequency '85	'91	'94	'99	Average Cover % '94	'99
G	Bouteloua gracilis	48	66	61	64	21	25	26	25	1.16	1.66
G	Carex spp.	-	6	-	-	-	2	-	-	-	-
G	Oryzopsis hymenoides	1	3	-	1	1	2	-	1	-	.00
G	Sitanion hystrix	43	72	56	50	22	34	27	22	.34	.55
G	Stipa comata	$_{ab}$9	$_{b}$17	$_{a}$-	$_{a}$1	4	8	-	1	.00	.00
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		101	164	117	116	48	71	53	49	1.50	2.22
Total for Grasses		101	164	117	116	48	71	53	49	1.50	2.22
F	Androsace septentrionalis (a)	-	-	-	7	-	-	-	4	-	.02
F	Arabis demissa	-	3	-	-	-	2	-	-	-	-
F	Astragalus convallarius	1	2	3	-	1	1	1	-	.00	-
F	Astragalus spp.	-	-	-	3	-	-	-	2	-	.01
F	Chaenactis douglasii	-	3	-	-	-	1	-	-	-	-
F	Cryptantha jamesii	$_{c}$30	$_{bc}$24	$_{b}$6	$_{a}$-	14	12	4	-	.04	-
F	Cryptantha spp.	-	-	3	-	-	-	1	-	.03	-
F	Erigeron pumilus	4	8	3	3	3	4	3	2	.01	.01
F	Hymenoxys richardsonii	39	59	42	51	17	30	19	22	1.16	2.17
F	Phlox longifolia	-	-	-	3	-	-	-	1	-	.00
F	Townsendia incana	-	3	-	-	-	2	-	-	-	-
Total for Annual Forbs		0	0	0	7	0	0	0	4	0	0.01
Total for Perennial Forbs		74	102	57	60	35	52	28	27	1.25	2.19
Total for Forbs		74	102	57	67	35	52	28	31	1.25	2.21

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 25B, Study no: 2

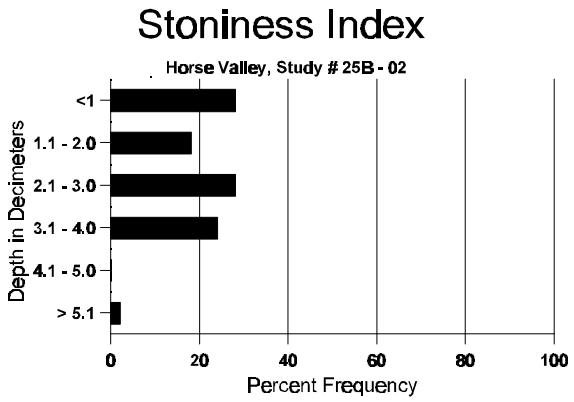
Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Artemisia frigida	0	0	-	-
B	Artemisia nova	24	2	4.38	.03
B	Artemisia tridentata vaseyana	0	17	-	4.19
B	Artemisia tridentata wyomingensis	58	67	10.72	14.72
B	Atriplex canescens	0	3	-	-
B	Chrysothamnus viscidiflorus stenophyllus	46	25	1.06	.46
B	Echinocereus triglochidatus	0	1	-	-
B	Gutierrezia sarothrae	41	68	.18	1.15
B	Leptodactylon pungens	0	1	-	-
B	Opuntia spp.	7	17	.04	.13
B	Pinus edulis	0	4	-	.15
Total for Browse		176	205	16.39	20.85

BASIC COVER --
Herd unit 25B, Study no: 2

Cover Type	Nested Frequency '94	'99	Average Cover % '85	'91	'94	'99
Vegetation	201	230	6.50	5.75	18.79	24.79
Rock	302	211	11.00	17.25	18.92	12.81
Pavement	303	309	31.50	25.75	8.72	22.56
Litter	349	317	23.50	14.50	16.85	21.91
Cryptogams	66	96	1.75	.75	1.15	2.45
Bare Ground	340	308	25.75	36.00	34.85	24.42

SOIL ANALYSIS DATA --
Herd Unit 25B, Study # 02, Study Name: Horse Valley

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.5	53.8 (16.8)	7.6	50.9	27.8	21.3	2.2	7.7	112.0	0.5



PELLET GROUP FREQUENCY --
Herd unit 25B, Study no: 2

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	14	9	n/a
Deer	8	3	1 (2)
Cattle	0	0	1 (2)

BROWSE CHARACTERISTICS --
Herd unit 25B, Study no: 2

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia frigida																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66	3	3	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'85	00%	00%	00%
'91	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

Total Plants/Acre (excluding Dead & Seedlings)			%Change
	'85	0	Dec: -
	'91	66	-
	'94	0	-
	'99	0	-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	9	-	-	1	-	-	-	-	-	10	-	-	-	200			10
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	-	6	-	-	-	-	-	-	-	6	-	-	-	400	9	17	6
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	19	1
	94	23	1	-	1	-	-	-	-	-	25	-	-	-	500	18	33	25
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	18	1
D	85	-	1	-	-	-	-	-	-	-	-	-	1	-	66			1
	91	3	-	-	-	-	-	-	-	-	-	-	3	-	200			3
	94	21	2	-	-	-	-	-	-	-	7	-	-	16	460			23
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	100%	00%	14%	-43%
'91	00%	00%	75%	+73%
'94	06%	00%	33%	-96%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'85	466	Dec:	14%	
'91	266		75%	
'94	980		47%	
'99	40		50%	

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	85	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	-	-	-	1	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	85	7	4	-	-	-	-	-	-	-	10	-	1	-	733			11
	91	5	3	-	1	-	-	-	-	-	9	-	-	-	600			9
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	99	20	-	-	1	-	-	1	-	-	22	-	-	-	440			22
M	85	10	33	2	-	-	-	-	-	-	41	-	4	-	3000	20	26	45
	91	10	8	4	1	2	-	-	-	-	24	1	-	-	1666	17	24	25
	94	46	32	2	-	-	-	-	-	-	80	-	-	-	1600	20	36	80
	99	70	35	2	3	1	-	-	-	-	111	-	-	-	2220	19	30	111
D	85	1	6	2	-	-	-	-	-	-	9	-	-	-	600			9
	91	14	4	4	3	2	-	-	-	1	20	-	1	7	1866			28
	94	44	11	3	-	-	-	-	-	-	24	-	-	34	1160			58
	99	49	26	3	10	1	2	-	-	-	60	-	-	31	1820			91
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	940			47
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	940			47

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	66%	06%	08%	- 5%
'91	31%	15%	13%	-31%
'94	30%	04%	24%	+37%
'99	28%	03%	14%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	4333	Dec:	14%
	'91	4132		45%
	'94	2840		41%
	'99	4480		41%

Atriplex canescens																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	2	1	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3
D	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'99	25%	00%	25%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	0%
	'91	0		0%
	'94	0		0%
	'99	80		25%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus stenophyllus																		
S	85	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	85	11	4	-	-	-	-	-	-	-	15	-	-	-	1000			15
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	85	43	8	5	-	-	-	-	-	-	49	-	7	-	3733	5	7	56
	91	-	3	-	-	-	1	-	-	-	4	-	-	-	266	5	7	4
	94	68	19	8	7	-	-	-	-	-	102	-	-	-	2040	4	6	102
	99	34	-	-	3	-	-	-	-	-	37	-	-	-	740	6	10	37
D	85	34	17	8	-	-	-	-	-	-	49	-	7	3	3933			59
	91	36	26	17	8	10	7	4	-	-	38	-	8	62	7200			108
	94	15	25	3	2	-	-	-	-	-	27	-	-	18	900			45
	99	11	-	-	2	-	-	-	-	-	6	-	-	7	260			13
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	420			21
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	22%	10%	13%	-13%
'91	35%	22%	62%	-61%
'94	30%	07%	12%	-60%
'99	00%	00%	12%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	8666	Dec:	45%
	'91	7532		96%
	'94	2940		31%
	'99	1180		22%

Echinocereus triglochidatus																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4	6	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'91	0		-
	'94	0		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	85	142	-	-	-	-	-	-	-	-	142	-	-	-	9466			142
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	114	-	-	3	-	-	-	-	-	116	1	-	-	2340			117
Y	85	15	-	-	-	-	-	-	-	-	15	-	-	-	1000			15
	91	9	-	-	-	1	-	-	-	-	10	-	-	-	666			10
	94	8	-	-	2	-	-	-	-	-	10	-	-	-	200			10
	99	149	-	-	10	-	-	-	-	-	159	-	-	-	3180			159
M	85	69	7	-	-	-	-	-	-	-	70	-	6	-	5066	7	6	76
	91	71	1	-	22	-	-	4	-	-	96	1	1	-	6533	5	4	98
	94	47	-	-	9	-	-	-	-	-	56	-	-	-	1120	7	6	56
	99	63	-	-	2	-	-	-	-	-	65	-	-	-	1300	7	8	65
D	85	1	1	-	-	-	-	-	-	-	-	-	-	2	133			2
	91	10	-	1	4	-	-	-	-	-	14	-	1	-	1000			15
	94	5	-	-	-	-	-	-	-	-	4	-	-	1	100			5
	99	23	-	-	2	-	-	-	-	-	24	-	-	1	500			25
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	09%	00%	09%	+24%
'91	02%	.81%	02%	-83%
'94	00%	00%	01%	+71%
'99	00%	00%	.40%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	6199	Dec:	2%
	'91	8199		12%
	'94	1420		7%
	'99	4980		10%

Leptodactylon pungens																		
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'91	0		-
	'94	0		-
	'99	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
Y	85	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	91	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	5	-	-	3	-	-	-	-	-	7	1	-	-	160			8
M	85	22	-	-	-	-	-	-	-	-	13	-	9	-	1466	3	4	22
	91	6	-	-	-	-	-	1	-	-	7	-	-	-	466	3	4	7
	94	7	-	-	-	-	-	-	-	-	7	-	-	-	140	3	7	7
	99	12	-	-	3	-	-	1	-	-	16	-	-	-	320	3	11	16
D	85	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	2	1	-	-	-	-	-	-	-	3	-	-	-	200			3
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	6	-	-	-	-	-	-	-	-	-	-	-	6	120			6
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	33%	-48%
'91	07%	00%	00%	-83%
'94	00%	00%	00%	+73%
'99	00%	00%	20%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	1799	Dec:	11%
	'91	932		21%
	'94	160		13%
	'99	600		20%

Pinus edulis																		
S	85	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	91	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
Y	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	1	-	-	-	-	-	4	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	+ 0%
'91	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	66	Dec:	-
	'91	66		-
	'94	0		-
	'99	80		-